

The DMG MORI magazine for existing and prospective customers.

DMG MORI Software Solutions – solutions for the Digital Transformation: CELOS®, technology cycles and power tools.

CUSTOMER FIRST – We have been listening! 5 service promises for the highest quality service at fair prices.

CLX / CMX: Attractive base machine with maximum precision and a multitude of options.

Integrated technology solutions for the Die & Mould and Medical industry.

DMG MORI

JOURNAL

N° 1 – 2017

Virtual becomes real

The digital path from the idea to the finished part

More on Page _____ 2

PATH OF DIGITIZATION

CELOS® Manufacturing

Digital Factory

CELOS® Machine



NEW

Automation

More on Page _____ 10



NEW

Additive Manufacturing

More on Page _____ 24

Shape the future with manufacturing and automation solutions for Industry 4.0

DMG MORI promotes automated technology and sector solutions for small, medium and large customers and invests in pioneering processes and digital solutions for the shop floor of the future.

Read more on this topic on page

2

CELOS®

With CELOS® into the age of Industry 4.0



PATH OF



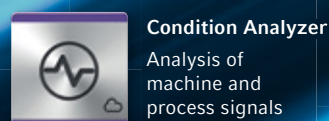
➤ **MORE THAN JUST SMART**

CELOS® Machine

- + CELOS® APP-based control and operating system
- + 26 CELOS® APPs for machine configuration, process optimisation and digital interaction
- + Up to 60 sensors for monitoring and supervision of machine and process
- + DMG MORI technology cycles for efficient dialogue-based workshop programming

NEW CELOS® PERFORMANCE PACKAGE

Software package for the visualisation of machine states in order to increase availability



Extended functional scope in conjunction with sensor package I4.0

➤ **INTELLIGENT WORKFLOW**

CELOS® Manufacturing

- + CELOS® APP-based digital workflows for maximum efficiency on the shop floor

26 CELOS® APPs in the process

Current CELOS® APPs for Digital Manufacturing

MATERIAL / WORKPIECE

PROGRAM / PROCESS



JOB MANAGER



SURFACE ANALYZER



JOB MANAGER



TECH CALCULATOR



JOB ASSISTANT



CAD-CAM VIEW



JOB ASSISTANT



CAD-CAM VIEW



3D PART ANALYZER



CONTROL



DOCUMENTS



FIND OUT ALL ABOUT OUR 26 CELOS® APPS, CURRENT CELOS® PROJECTS AND FREE UPDATES:

celos.dmgmori.com



EDITORIAL



➤ EXCELLENCE IN PRODUCTION

Digital Factory

- + Integrated production planning and control with digital solutions from DMG MORI

TOOL / CLAMP		CELOS® MACHINE		



Dr. Ing. Masahiko Mori, President, DMG MORI COMPANY LIMITED and Christian Thönes, Chairman, DMG MORI AKTIENGESELLSCHAFT

Successful new alignment and exciting innovations

Dear customers, partners and potential customers,

DMG MORI is developing dynamically. For your benefit, we are reorganising ourselves and are concentrating on our core business with machine tools and services. We hope to impress you with our innovations and integrated technology solutions and continue to be a leader in this field. Our objective is your success! If you are satisfied, then we are too!

You, dear customers and partners, are at the centre of our customer focus and therefore our "Customer First" programme. Take advantage of our 5 service promises! You can now get original spare parts with a "Best Price" guarantee and highest availability, new call-out fees, all-round carefree contracts and much more. Please see page 6 of this journal for more details.

We are continuing to work on our "First Quality Strategy" with great passion. As a "Global One Company", with DMG MORI COMPONENTS we are combining quality, accuracy and robustness. The 18-month warranty with unlimited hours for all speedMASTER® spindles is an example of how you can benefit directly from our global quality offensive.

In 2017, we are concentrating on EMO Hannover. Our new developments are aimed at this industry highlight. Nevertheless, right at the start of the year, we are now able to present to you three world premieres and important innovations:

- + We are strengthening our expertise in Additive Manufacturing! In collaboration with REALIZER, DMG MORI will in future also be offering Selective Laser Melting and with it a perfect addition to our Advanced Technologies.
- + We will be promoting digitalisation! We are further expanding our software with innovative solutions. These are based on CELOS®. With 26 APPS, we already support networked intelligent production. Our 26 exclusive DMG MORI technology cycles enable shop floor programming to be carried out quickly and easily. In production engineering, our DMG MORI Powertools simplify the automatic production of programs.

You will see that, as a "Global One Company", we are highly diversified and possess great technical expertise, innovation and global presence. Make use of our power. We are here for you – no matter where, no matter when! Please get in touch with us! Our staff throughout the world are always ready to help!

Dr. Ing. Masahiko Mori,
President
DMG MORI COMPANY LIMITED

Christian Thönes,
Chairman
DMG MORI AKTIENGESELLSCHAFT

DMG MORI Technology cycles | Power tools

Up to 60% faster programming

HIGHLIGHTS: DMG MORI TECHNOLOGY CYCLES

- + **Dialogue-assisted programming** with 26 exclusive cycles for handling, measuring, clamping and monitoring
- + **NEW:** Intelligent grinding cycles for internal, external and surface grinding
- + **Real-time monitoring** for maximum process safety and component quality

Shop floor programming with exclusive DMG MORI technology cycles



Watch the video on
3D quickSET®
dmgmori.com/en6450



> HANDLING CYCLES



> MEASURING CYCLES



> MACHINING CYCLES



> MONITORING CYCLES



SELECTED EXAMPLES:

TOOL SORTING CYCLE

- + Shorter idle times thanks to automatic sorting of the tools in the magazine in the required sequence
- + Time-optimised sorting in the chain magazine by using the tool shuttle instead of the spindle

3D QUICKSET®

- + Tool kit for checking and correcting the kinematic accuracy of 4 and 5-axis machine configurations
- + All head variants and table axes
Note: In conjunction with the measuring probe option only

GRINDING 2.0

- + The AE (Acoustic Emission) sensor detects the first contact between grinding wheel and workpiece
- + For internal, external and surface grinding
- + Dressing cycles for dressing the grinding wheel

MPC 2.0 – MACHINE PROTECTION CONTROL*

- + Vibration sensor on the milling spindle
- + NEW: Cutting force monitoring for drilling and thread-cutting



*For turning-milling machines including Easy Tool Monitoring 2.0 as a package

CAM programming with exclusive DMG MORI power tools

” Three times as many parts from the machine thanks to power tools from DMG MORI! We would not have been able to realise the growth of the last 2 years without this solution.

Christian Ruhland,
Managing Director AyTec Automation GmbH

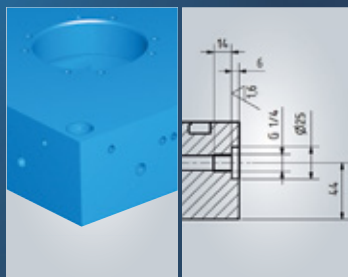
HIGHLIGHTS

- + Automatic program creation in production engineering
- + **NEW:** Technology Library, Adaptive Process, CAM Agent
- + **NEW:** 24 DMG MORI experts assist you with the introduction of SIEMENS NX, AUTODESK FeatureCAM and ESPRIT
- + Exclusive modular DMG MORI software solutions

Technology Library

Reliable production based on your expertise!
Save and retrieve whole sequences and tool technologies at the press of a button.

- + **Recognised features** are specified with familiar tools and technology parameters
- + **Approved cutting parameters** are automatically assigned in new programs



Virtual Machine

Avoid real problems in the virtual world!
Multi-machine control and unmanned production by controlling your NC programs

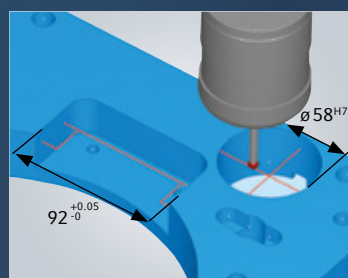
- + **1:1 simulation with numerous new functions**
- + **Simple handover to the simulation software using DMG MORI interfaces for:**
 - Clamping devices
 - Zero points and table positions
 - Tools and NC programs



Adaptive Process

Quality under control!
Fully automatic in-process alignment of components, machining of fits and recording

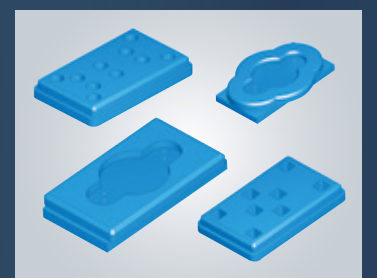
- + **Easy-to-use input screens enable ...**
 - Fits to be produced with high accuracy
 - Measuring probes to be calibrated
 - Measurements to be recorded
- + Adaptive process control
- + All directly on the controller without interfering with the machine



CAM Agent

NC programs without end!
Component families from your CAD software once learned automatically generate NC programs to your requirements for any variants.

- + **DMG MORI Smart Programming enables:**
 - Learning of a template from any CAD system
 - Automated program creation while maintaining all previously defined procedures and technologies
 - Automatic matching of programs to existing tools and technologies when changing machines



CUSTOMER FIRST

Our 5 service promises!

1



2



» SPARE PARTS

DMG MORI SPARE PARTS SERVICE

MAXIMUM AVAILABILITY WITH A GLOBAL PRESENCE.

- + Global logistics network for all non-domestic markets
- + More than 280,000 different items in stock
- + More than 1,000 spindles available immediately
- + Spare parts availability rate of > 95 %
- + New and replacement parts available
- + Many spare parts also available for older series dating back to 1970

DMG MORI MAINTENANCE KITS



- + More than 200 different maintenance kits available, all perfectly customised for each machine type
- + Ensuring machine availability
- + All important wear parts in one kit
- + Protection from expensive subsequent damage
- + Save up to 25 % with our attractive package rate

More information, descriptions and prices for our maintenance kits are available from your local service team: www.dmgmori.com

BEST PRICES ORIGINAL SPARE PARTS

BEST PRICE GUARANTEE

If you should find a spare part quoted or supplied by us elsewhere at least 20 % cheaper, we will immediately refund you the price difference up to 100 %. Guaranteed!

IT'S THAT EASY

Simply email with our quotation or order number together with the cheaper alternative quote or Internet link to the alternative supplier to spare parts: bestprice@dmgmori.com

” At last we can order spares from DMG MORI and know that we are paying the correct price. Someone finally listens to the customer. “

Doug Murphy (Managing Director),
Metaltech Precision Engineers Ltd, United Kingdom

BEST PRICE
GUARANTEE
FOR SPARE
PARTS

* You will find the conditions for our Best Price offer at spareparts-bestprice@dmgmori.com

BEST PRICES SPINDLE SERVICE

DMG MORI SPINDLE REPAIR

- + Fast, reputable and reliable
- + **NEW: 9 months** warranty
- + Fixed price at no additional costs
- + Replacement of rotary union included

DMG MORI REPLACEMENT SPINDLE SERVICE

- + Fully refurbished replacement spindles or new spindles for immediate use
- + **NEW: 18 months** (for new parts) or 9 months (replacement parts) warranty
- + More than 1,000 spindles available immediately

” My spindle repair was made by DMG MORI. I am very satisfied with these new proposals and I am sure that this will consolidate the relations between my company and DMG MORI. “

UNIMOLDS Srl,
Bovolenta PD, Italy



Get your individual spindle service offer with just a few clicks:

spindleservice.dmgmori.com



3

4

5



» SERVICE

MANUFACTURER SERVICE YOU CAN RELY ON

PREVENTIVE SERVICE TO REDUCE DOWNTIMES

RECONDITIONING

HIGHLIGHTS

- + More than 2,500 highly qualified service technicians worldwide
- + Unrivalled availability and operational capability with our extensive service network
- + Proximity to our customers, with more than 150 technology and service centres worldwide
- + 24 / 7 service hotline: Our experts can solve your problems over the phone in 60 % of cases
- + Minimising unplanned machine failures through preventive maintenance
- + More than 300 innovative service products to help optimise your processes
- + Comprehensive training portfolio



DMG MORI SERVICE PLUS

- + **Inspection Plus:** Cost-efficient service entry package with detailed report on machine status
- + **Maintenance Plus:** Full 2,000 hour maintenance with replacement of all necessary wear parts
- + **ServiceCompetence Plus:** We help you to maintain your machine and show you all you need to know about performing your own maintenance

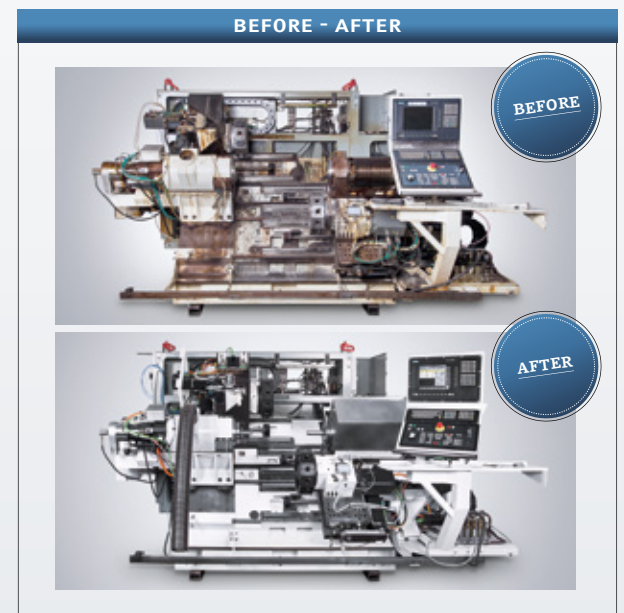
” DMG MORI's *Maintenance Plus* is the right choice for us. This gives us both assurance and a price benefit. “

Eamon Lyons (Managing Director),
Midland Aerospace, United Kingdom



RE-ESTABLISH PERFORMANCE UP TO 100 %

- + Safeguard productivity and established processes
- + Maintain and increase performance
- + Re-establish the machine accuracy
- + Refurbishment by experienced experts with exclusive manufacturer know-how
- + Warranty on full scope of service



DO YOU HAVE ANY QUESTIONS?
We will get back to you by return.
Simply send an email to:
customer.first@dmgmori.com

Find out more about predictable and lower operating costs at:
serviceplus.dmgmori.com

ARE YOU INTERESTED?
We will get back to you by return.
Simply send an email to:
lothar.sommer@dmgmori.com

6-sided complete machining

From universal turning ...

BMT® turret with 10,000 rpm

- + Improved machining capacity and milling accuracy

Flat guides on all axes

- + Optimum damping characteristics and dynamic rigidity

100 mm Y-axis

- + Eccentric machining



NLX 2500SY | 700

- + The top-seller with counter spindle and Y-axis
- + Turning diameter up to 366 mm
- + Turning length up to 705 mm

➤ TECHNOLOGY CYCLES EXAMPLES OF UNIVERSAL TURNING



GEAR MILLING

- + Programming of gear parameters via dialogue inputs
- + Tool service lives maximised by shifting the milling cutter
- + Achievable quality \leq DIN 8



EASY TOOL MONITOR

- + Damage prevention in the case of broken or overloaded tools
- + Immediate feed stop after one second
- + No sensors thanks to innovative evaluation algorithms
- + Automated learning of load limits

... to Turn & Mill

Up to 80 tools
+ Unlimited flexibility and shortest set-up times

compactMASTER® with 120 Nm
+ 530 cm³/min chip removal rate (Ck45)

< 5 μm thermal stability
+ Excellent surface quality thanks to spindle length compensation

CTX BETA 800 TC

- + Universal package with chuck, chip conveyor, internal coolant supply and multi-tools as standard
- + Turning diameter up to 500 mm
- + Turning length up to 800 mm

TECHNOLOGY CYCLES EXAMPLES TURN & MILL

PROTECTION PACKAGE*

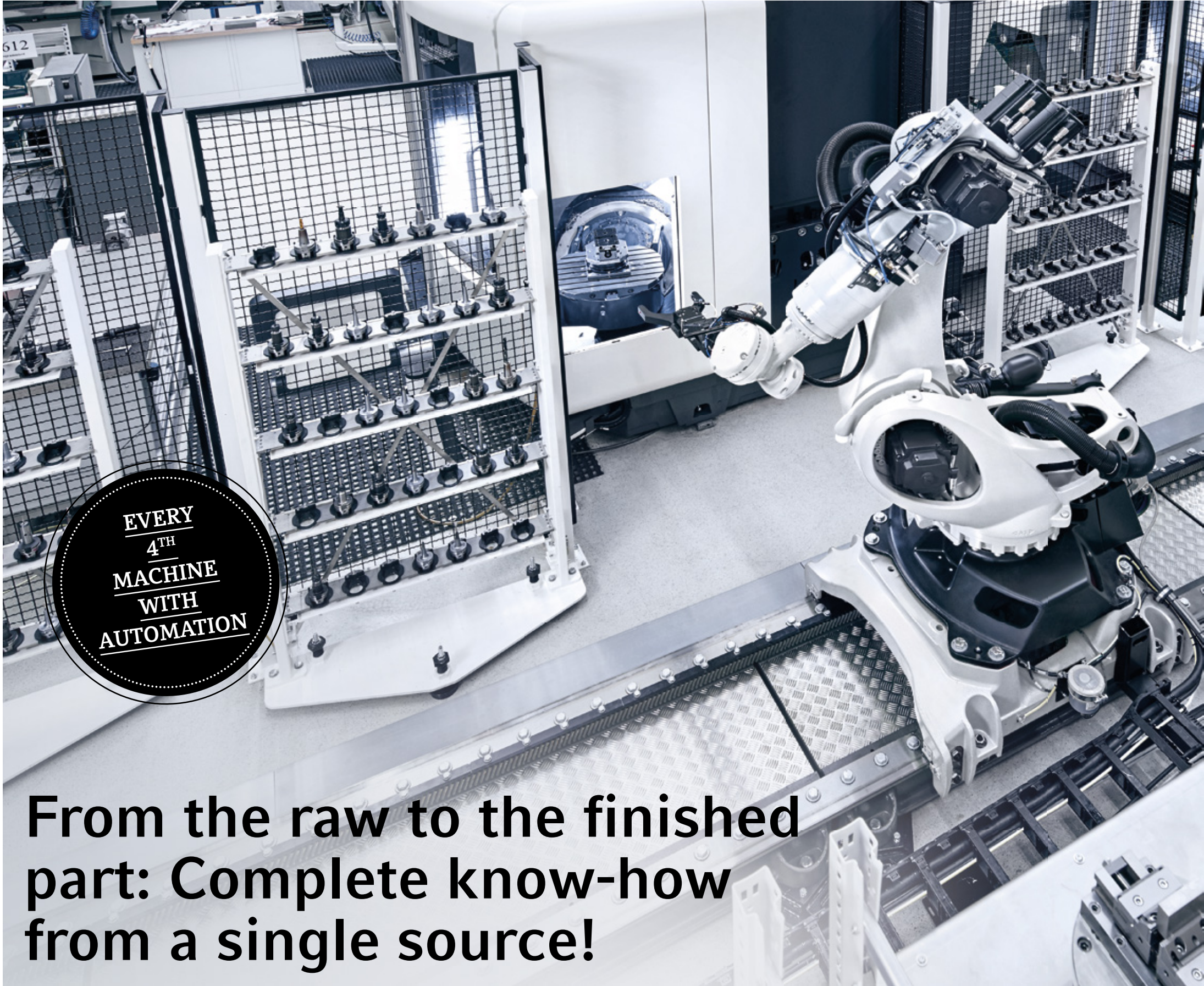
- + Increased efficiency due to reduced idle times
- + Machine Protection Control
 - Vibration sensor on the milling spindle
 - Rapid shutdown < 10 milliseconds
- + Easy Tool Monitor 2.0
 - Tool monitoring system

*Package comprising MPC and Easy Tool Monitor 2.0

5-AXIS SIMULTANEOUS MACHINING

- + Intelligent movement guidance for perfect surfaces
- + Free-form surfaces using 5-axis interpolation
- + 5-axis movements programmed using customer's CAD/CAM system
- + Look-ahead function for continuous processing





From the raw to the finished part: Complete know-how from a single source!

➤ **EXAMPLES OF PALLET HANDLING**

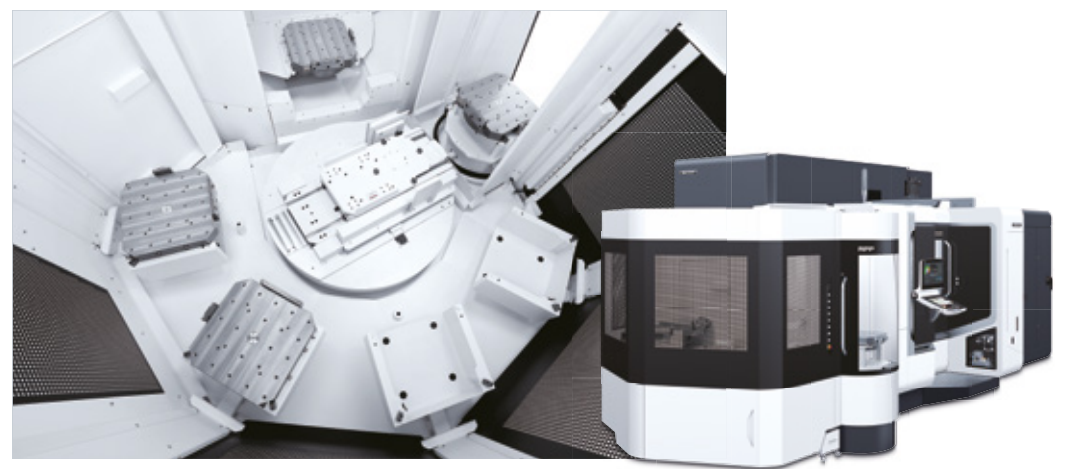
PH – PALLET HANDLING

- + Cost-effective automation solution for 1 machine with 1 set-up station
- + 8 additional pallet set-down positions as standard, 30 max.



RPP & RS – ROTARY PALLET POOL

- + Simple automation solution for 1 machine with 1 set-up station
- + Up to 11 additional pallet positions



➤ EXAMPLES OF STANDARD AUTOMATION

CTX beta 800 TC WITH Robo2Go

- + Available for all DMG MORI universal lathes with CELOS®
- + No robot knowledge required, control via CELOS®
- + Free accessibility for the operator



MILLTAP 700 WITH WH3

- + Workpieces up to a maximum of 7 kg
- + Working radius of 892 mm
- + 15-way workpiece-carrier circulating system



➤ EXAMPLES OF CELLS

MODULAR CELL SYSTEM

- + Workpiece and tool handling
- + Standardised 710 mm module width for easy cell matching
- + Wide range of peripheral modules, e.g.
 - Deburring
 - Washing
 - Measuring
 - Tool handling



- NRX 2000 with robotic loading incl. position detection for bulk material**
- + Gantry loader for transfer from buffer to Process 1 and 2

2x CTX alpha WITH GANTRY LOADING



- + Integration of up to 8 machines
- + Standardised, function-oriented modules
- + Modular system
- + Workpiece, pallet and tool handling

CPP – CARRIER PALLET POOL

- + Extendable for up to 4 machines with up to 2 set-up stations
- + Up to 29 additional pallet positions



LPP – LINEAR PALLET POOL

- + Extendable for up to 8 machines with up to 5 set-up stations
- + Up to 99 additional pallet positions on 2 levels



DMU 50 3rd Generation

2017
World
Premiere
DMG MORI

5-axis machining with speedMASTER® as standard

18-month warranty
with unlimited hours

30, 60 and 120 tools

speedMASTER® spindle options:

- + 15,000 rpm / 21 kW, 111 Nm
- + 15,000 rpm / 46 kW, 200 Nm
- + 20,000 rpm / 35 kW, 130 Nm

- + 78 % larger work area
- + 40 % higher rapid traverse speeds
42 m/min as standard
- + 28 % greater swivel range,
Swivel rotary table with $-35^{\circ}/+110^{\circ}$
- + Experience gained from more than
10,000 machines already supplied
- + 5-axis simultaneous machining as standard

78%
LARGER WORK
AREA WITH
< 6.7 m²
FOOTPRINT



DMG MORI COMPONENTS

FOR MAXIMUM RELIABILITY AND QUALITY

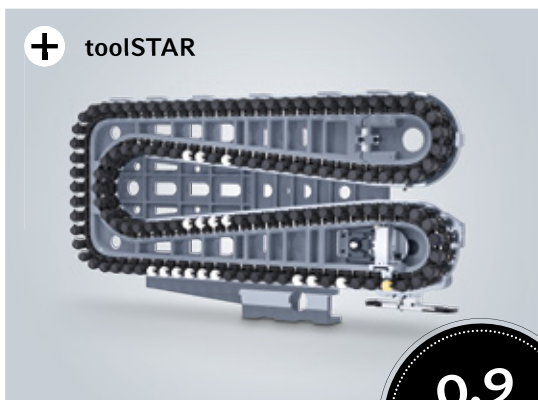
+ speedMASTER®



- + speedMASTER®-
spindles up to 20,000 rpm

18
MONTHS
WITH UNLIMITED
HOURS

+ toolSTAR



- + toolSTAR
up to 120 tools

0.9
SECOND
TOOL CHANGE

+ Accuracy



Magnescale

- + Direct travel measuring systems on all 5 axes as standard
- + Directly driven ball screw drives
- + Cooling



NEW

- PROtime** – display for:
- + Remaining runtime
 - + Coolant warning
 - + Hydraulic oil warning
 - + Imminent tool change warning



CELOS®

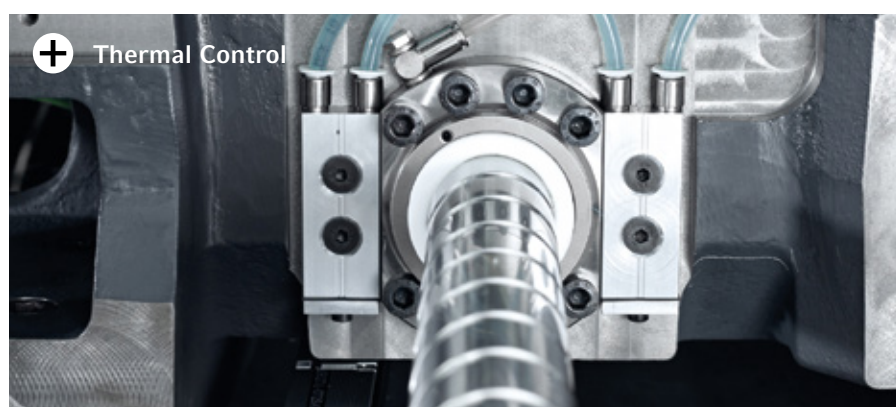
CONTROL OPTIONS

CELOS® FROM DMG MORI WITH 21,5" ERGoline® AND SIEMENS

19" DMG MORI ERGoline® CONTROL WITH HEIDENHAIN TNC 640



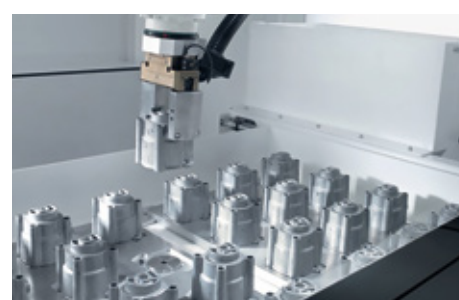
HIGHEST ACCURACY THANKS TO INTEGRATED COOLING CONCEPT



- + Thermal Control
- + Cooling of ball screw nuts, guides and bearings
- + Spindle cooling
- + Cooling of table bearings

AUTOMATION OPTIONS

TOOL HANDLING



- e.g. WH 10**
- + Full machining thanks to additional operations
 - + Flexible system with maximum storage capacity
 - + Integral workpiece magazine for loading in parallel with production

PALLET HANDLING



- e.g. PH 15018**
- + Inexpensive entry level
 - + Integral pallet magazine with 8 pallet set-down positions (option: up to 30 positions)
 - + Pallet setup station with intuitive touch screen control panel

WORLD PREMIERE

Compact, stable, precise –
With > 50 customer-
specific options!

CLX / CMX

=

Compact
Competitive
Customised



2017
World
Premiere

DMG MORI

FOOTPRINT
< 5m²

Technical Data		CLX 350	CLX 450
Max. swing diameter over bed	mm	ø 610	ø 650
Max. turning diameter	mm	ø 320 / 250***	ø 400 / 315*
Longitudinal travel Z-axis	mm	580	600
Bar capacity	mm	ø 51 / 65**	ø 80
Chuck diameter	mm	ø 210**	ø 210** / ø 250** / ø 315**
Tool interface		12 x VDI 30	12 x VDI 40 / 6 x BT
Compact footprint	m ²	4.98	5.8
Spindle power	kW	16.5 (40 % DC)	25.5 (40 % DC)
Ball screws		IT 1 (highest class)	IT 1 (highest class)
3D Control		19" DMG MORI SLIMline® Multi-Touch control with Operate 4.7 on SIEMENS	19" DMG MORI SLIMline® Multi-Touch control with Operate 4.7 on SIEMENS

*Version with V4 (for better milling performance), **Optional, ***Recommended



NEW
19" DMG MORI SLIMline®
Multi-Touch control with
Operate 4.7 on SIEMENS

HIGHLIGHTS

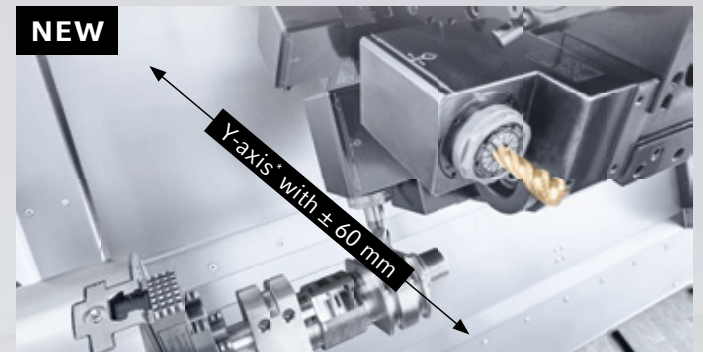
- + 19" Multi-Touch display
- + Import DXF files directly to the NC controller
- + Extended storage capacity with 4 GB and additional 8 GB on the DMG MORI SMARTkey®
- + 45° swivel range for optimum ergonomics

CUSTOMISATION



NEW TECHNOLOGY CYCLES
E.G. EASY TOOL MONITORING

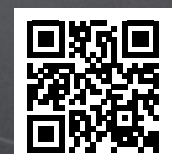
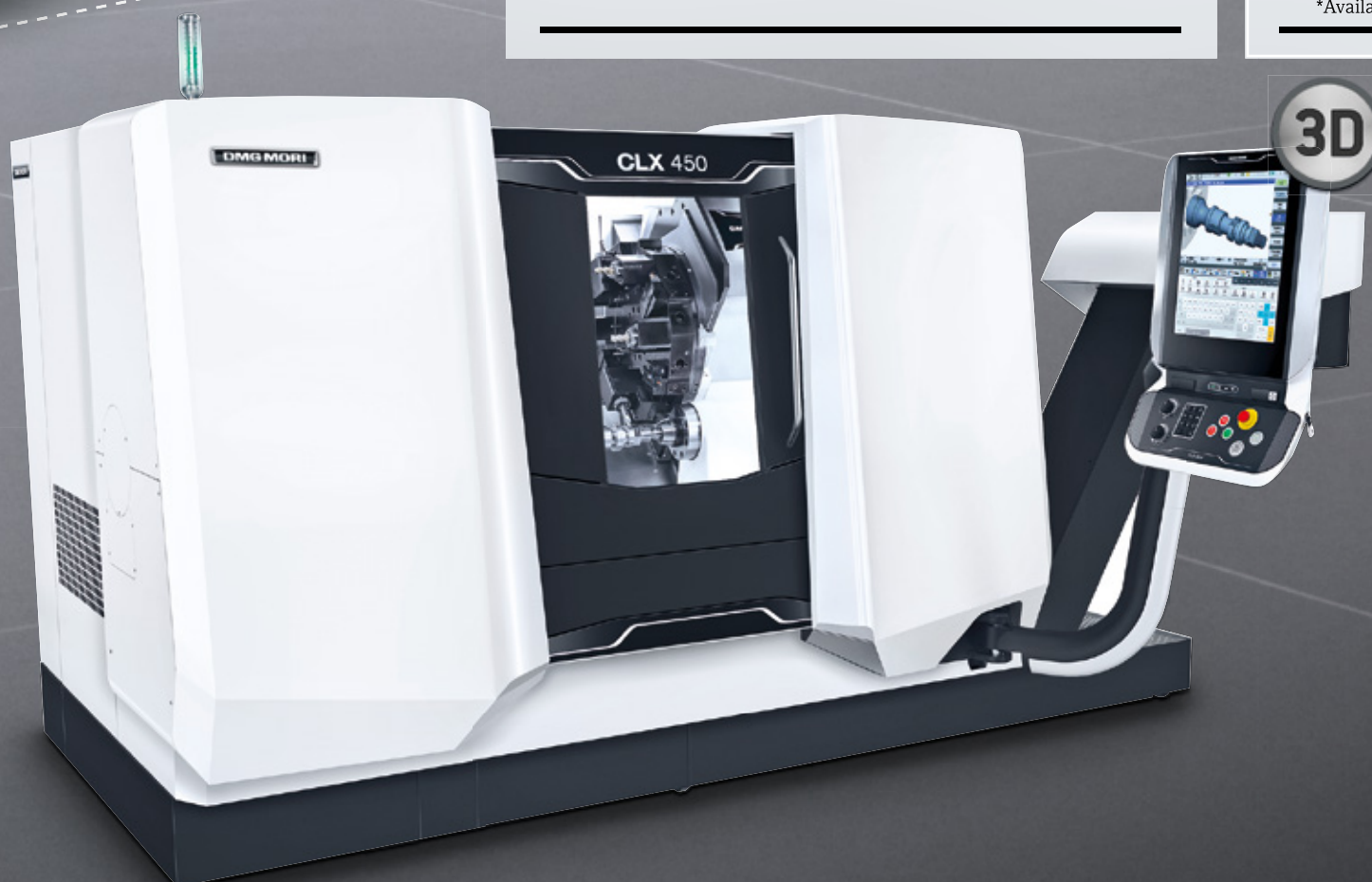
- + **Damage prevention** by controlled stopping of spindles and axes in the case of broken or overloaded tools
- + **Immediate feed stop:** Spindle stop after one second (tool cutting free)
- + **No sensors** thanks to innovative evaluation algorithms
- + **Automated learning of load limits** for turning, milling and drilling operations



NEW OPTIONS

- + **Differential pressure clamping** for main spindle
- + **Direct measuring systems (X / Z)**
- + **Tool measurement**
- + **Chip conveyor at rear**
- + **Automatic door**
- + **Automation package**
- + **Parts catcher**
- + **NC tailstock**

*Available for the CLX 450



Find out more about the CLX range at

clx.dmgmori.com



CMX

High-performance milling with powerful spindles and wide range of options!

CLX / CMX
=
Compact
Competitive
Customised


Technical Data	VERTICAL MACHINING			5-SIDED MACHINING		
		CMX 600 V	CMX 800 V	CMX 1100 V	CMX 50 U	CMX 70 U
Travel (X/Y/Z)	mm	600/560/510	800/560/510	1,100/560/510	500/450/400	750/600/520
Tool pockets	mm	30	30	30	30	30
Max. table load	mm	600	800	1,000	200	350
Max. spindle speed	rpm	12,000	12,000	12,000	12,000	12,000
Spindle power	kW	13 (40% DC)	13 (40% DC)	13 (40% DC)	13 (40% DC)	13 (40% DC)
19" DMG MORI SLIMline® Multi-Touch control with Operate 4.7 on SIEMENS		•	•	•	•	•
15" DMG MORI SLIMline® with HEIDENHAIN TNC 620		•	•	•	•	•
15" DMG MORI SLIMline® with MAPPS IV on FANUC		•	•	•	-	-

• available, – not available


 You will find more on the
 CMX V range at

cmx-v.dmgmori.com


MODULAR SYSTEM



3D

19" DMG MORI SLIMline®
Multi-Touch control
with Operate 4.7 on SIEMENS



3D

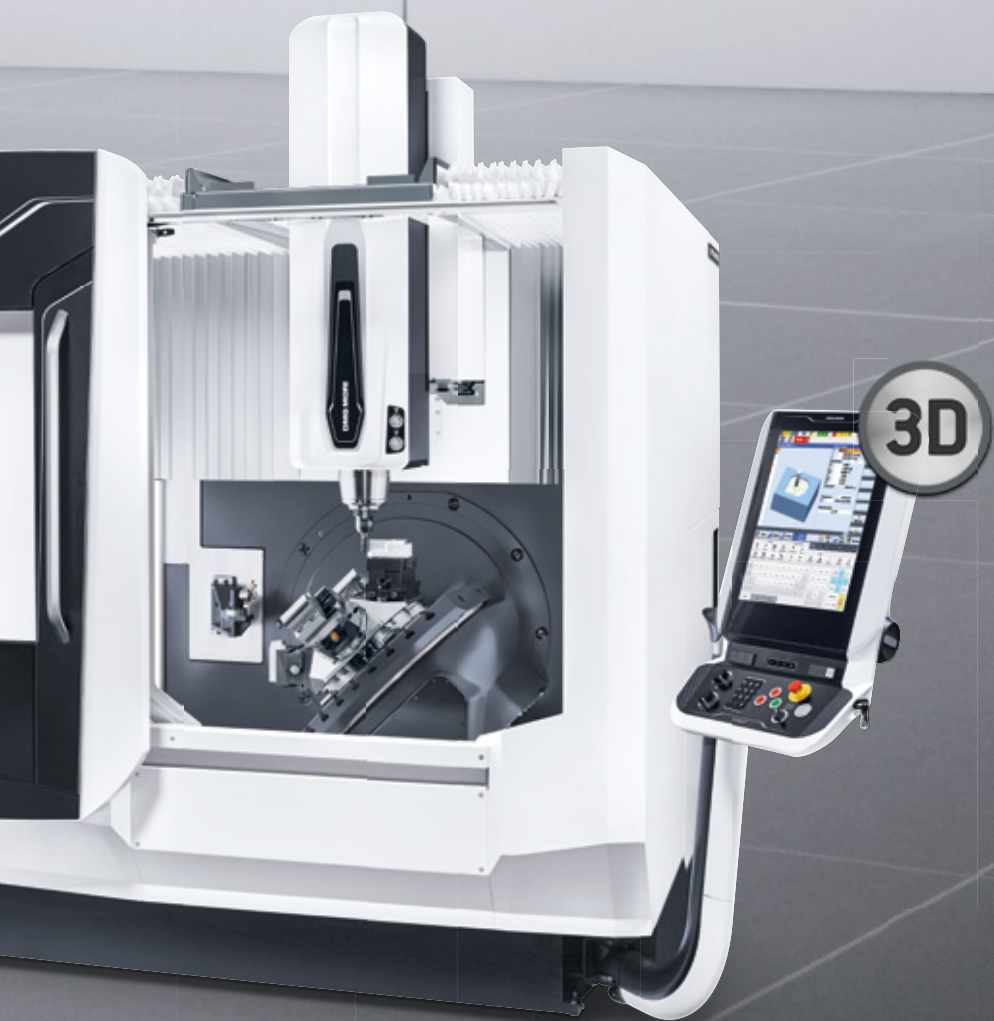
15" DMG MORI SLIMline®
with MAPPs IV on FANUC

NEW



3D

15" DMG MORI SLIMline®
with HEIDENHAIN TNC 620



3D

CUSTOMISATION

NEW



NEW AUTOMATION SOLUTIONS

- + Automation solution WH 10 with 6-axis robot
- + Load capacity 10 kg or 25 kg

NEW



NEW OPTIONS

- + LEHMANN 5-axis attachment table for the CMX V range
- + Pressurised air through the spindle centre
- + Process stability and precision thanks to measuring probe and tool measurement
- + Internal coolant supply with 12, 20 or 40 bar in the production packages

NEW



NEW TECHNOLOGY CYCLES

- + ATC – Application Tuning Cycle for the CMX V range: Minimum machining time combined with maximum component quality!
- + 3D quickSET® for the CMX U range: Quick and easy for maximum 5-axis precision!

DMG MORI – Your tool and mould making partner in all dimensions

➤ 3-AXIS



➤ 5-AXIS UNIVERSAL



DMC V

- + 20,000 rpm speedMASTER® spindle as standard
- + Innovative cooling concept and direct travel measuring systems for high precision

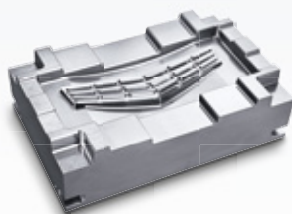
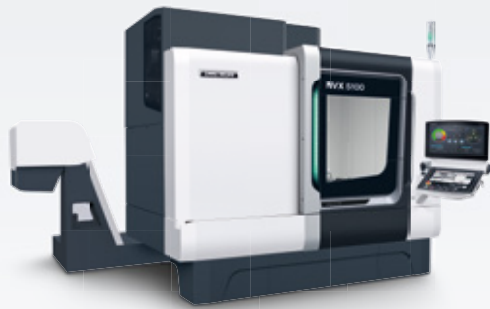


Forging die for hip nails

Machine: DMC 650 V
Material: 1.2343
Dimensions: 250 × 200 × 100 mm

NVX 5000 SERIES

- + 15,000 rpm speedMASTER® spindle with integral cooling as standard
- + High stability and damping thanks to slideways on all axes

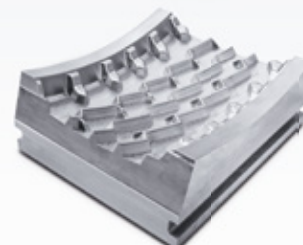


Mould for radiator grill

Machine: NVX 5100
Material: SKD61
Dimensions: 700 × 450 × 150 mm

DMU eVo *linear*

- + Dynamic 5-axis machining up to 80 m/min
- + 20,000 rpm speedMASTER® spindle as standard

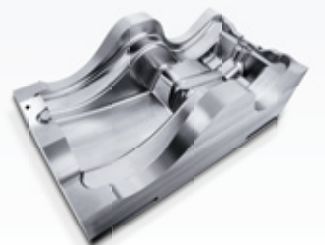


Tyre mould

Machine: DMU 60 eVo
Material: Toolox 33
Dimensions: 370 × 320 × 130 mm

DMU monoBLOCK®

- + Swivel rotary table concept with high loads and high dynamics
- + fully traversable table for rapid machining and top-quality surfaces



Mould for Bobby Car

Machine: DMU 65 monoBLOCK®
Material: 1.4122
Dimensions: 580 × 300 × 380 mm

DIE & MOULD MATRIX

	3-axis	5-axis universal	5-axis High Precision	New Technology
XXL > 2,700 mm		DMU 340 P, DMU 600 P DMF 360/600	DMU 600 Gantry <i>linear</i>	
Large 1,500 - 2,700 mm		DMU 210/ 270 DMF180/260	DMU 270 <i>μPrecision</i> DMU 210 <i>μPrecision</i>	LASERTEC 210 Shape
Small / Medium < 1,500 mm	DMC V NVX	DMU duoBLOCK® DMU monoBLOCK® DMU eVo <i>linear</i>	DMU 125 <i>μPrecision</i> NVD HSC <i>linear</i>	LASERTEC 75 Shape LASERTEC 45 Shape

➤ 5-AXIS HIGH PRECISION

➤ NEW TECHNOLOGY



DMU duoBLOCK® / DMU PORTAL

- + Machining of large workpieces of up to 3,000 x 6,000 mm
- + Also available as *μPrecision* for highest accuracies

HSC 30 / 70 *linear*

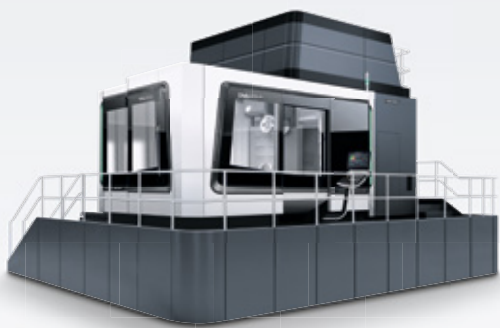
- + Linear drives for maximum long-term accuracy and Ra < 0.15 μm
- + HSC spindles up to 40,000 rpm with shaft, flange and sleeve cooling

DMU 600 GANTRY *linear*

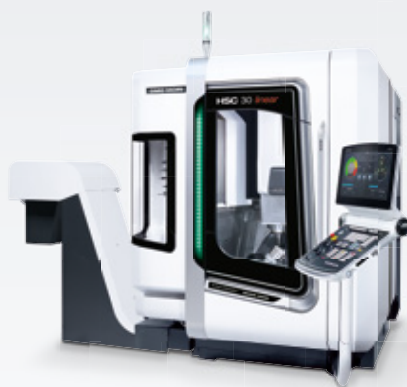
- + High-gantry design with table loading up to 150 t
- + 3 m/s² path acceleration thanks to linear drives on all axes

LASERTEC Shape

- + Texturing of geometrically defined surface structures
- + Low space requirement thanks to integral laser



Press tool for car wings
Machine: DMU 340 P
Material: 1.2343
Dimensions: 1,000 x 1,800 x 400 mm



Injection mould for headlamps
Machine: HSC 70 *linear*
Material: 1.2312
Dimensions: 680 x 400 x 350 mm, Ra < 0.15 μm



Mould insert for car bumpers
Machine: DMU 600 Gantry *linear*
Material: 21CrNiMo2
Dimensions: 2,500 x 1,000 x 1,400 mm



2017
World
Premiere
DMG MORI



Injection mould for Tablet PC cover
Machine: LASERTEC 75 Shape
Material: Aluminum
Dimensions: 290 x 220 x 65 mm

DIE & MOULD

KWS KÖLLE GMBH



Tool and mould-making components with micron accuracy thanks to high-speed cutting and Turn & Mill complete machining

With a total of 56 highly qualified specialists, Mauerstetten-based KWS Kölle GmbH has been a competent and reliable partner in the field of tool making and custom-made products since 1978. The company's expertise ranges from planning and design via development and production to quality assurance and maintenance.

In its demanding production facility, KWS has for many years relied on machine tool technology from DMG MORI – including a CTX beta 800 TC and an HSC 30 *linear*. For Managing Director Helmut Hübner, the former was the right machine at the right time: *"The ability to completely turn and mill complex workpieces on one machine represents an enormous gain in space and flexibility for KWS."* After all, tools are predominantly produced in batch sizes of 1. The compactMASTER® of the CTX beta 800 TC offers a tremendous advantage. *"With 120 Nm and a length of 350 mm, the ultra-compact turning-milling spindle provides considerably more options than a turret,"* says Helmut Hübner. *"Ultimately this has saved us a machine."*

"Our accuracy expectations from the 5-axis machining centres are enormous," explains Helmut Hübner with a glance at the HSC 30 *linear*. Up to 40,000 rpm and >2 g thanks to the linear drives impress both him and his employees: *"The dynamics of the machine are unsurpassed, particularly with 5-axis simultaneous milling – regardless of the material we are processing."* Tool wear is also considerably reduced – after all, KWS frequently processes highly alloyed steels up to HRC 68. Added to this is the high accuracy of the HSC 30 *linear*: *"We now often save ourselves the final grinding process as we can manufacture to an accuracy of a few microns."*



Helmut Hübner,
Managing Director,
KWS Kölle GmbH



HSC 30 *linear* – 40,000 rpm and linear drives ensure manufacturing results with micron accuracy, even with materials which are difficult to machine, e.g. tungsten and copper.

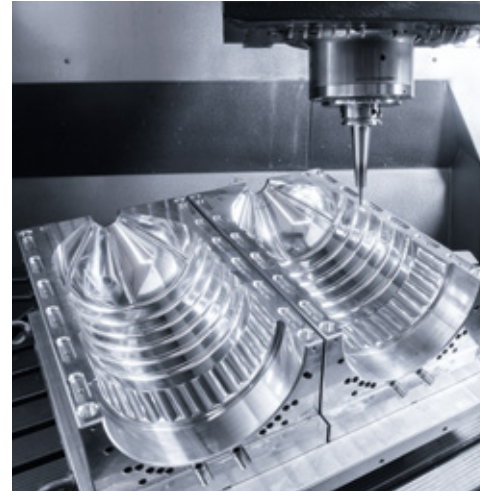


Highly accurate and complex parts are now completely turned and milled on just one machine thanks to the CTX beta 800 TC.

KWS
WERKZEUGBAU · SONDERFERTIGUNG

KWS Kölle GmbH Werkzeugbau-Sonderanfertigung
Lindenstraße 16, D-87665 Mauerstetten
info@kws-koelle.de, www.kws-koelle.de

KOSME GESELLSCHAFT MBH



Andreas Steidl, Manager for Mould Construction, appreciates the familiar dialogue programming and improved program simulation on the HEIDENHAIN TNC 640.

Production of high-precision bottle moulds on the DMU 95 monoBLOCK® with the new HEIDENHAIN TNC 640

When it comes to the development and manufacture of stretch blow moulding machines, KOSME Gesellschaft mbH, based in Sollenau near Vienna, relies on machining technology from DMG MORI and HEIDENHAIN. Blow moulds with volumes of up to 30 litres are produced on a DMU 95 monoBLOCK® with TNC 640. *"The innovative controller combines familiar dialogue programming in plain text with new functions such as improved program simulation,"* finds Andreas Steidl, Manager for Mould Construction. With its range of functions, the CNC 640 also optimises surface quality and throughput times. *"Furthermore, the DMU 95 monoBLOCK® has made a great impression with its attractive price,"* says Andreas Steidl, assessing the comprehensively equipped package machine.

The new eVo *linear* 5-axis universal milling machines account for a large proportion of the company's machine portfolio. They impress Andreas Steidl with their highly dynamic linear drives. In combination with the HSC spindles, outstanding machining results are obtained: *"At the end, all moulds are polished, but, thanks to the DMG MORI machines with spindle speeds of up to 40,000 rpm or 20,000 rpm in the case of the DMU 95 monoBLOCK®, we have been able to considerably reduce the subsequent processing effort."*

KOSME

KOSME Gesellschaft mbH
Gewerbestraße 3, A-2601 Sollenau
kosme@kosme-austria.com, www.kosme.at

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C5-3-80-LL35060-10C
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3D MODEL STP
2D MODEL DXF
KAPR 94.7°
v_c 381 m/min
f_r 0.4 mm/r
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DMU monoBLOCK® Now with 4 new options

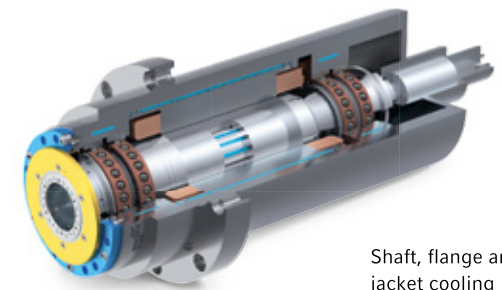


You will find more on the DMU monoBLOCK® range at monoblock.dmgmori.com

SPINDLES

1 Motorised spindles up to 40,000 rpm

- + Best quality surface finishes thanks to maximum speeds of up to 40,000 rpm
- + HSK-E50 / 20 kW (40 % duty cycle) / 16 Nm (40 % duty cycle)

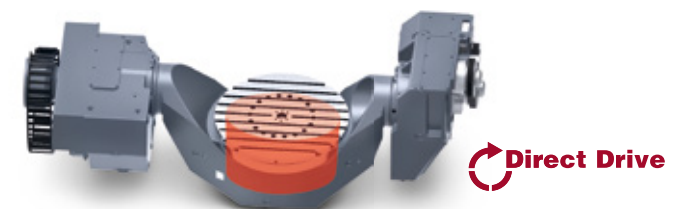


Shaft, flange and jacket cooling

DRIVE

2 Direct Drive technology on the C-axis

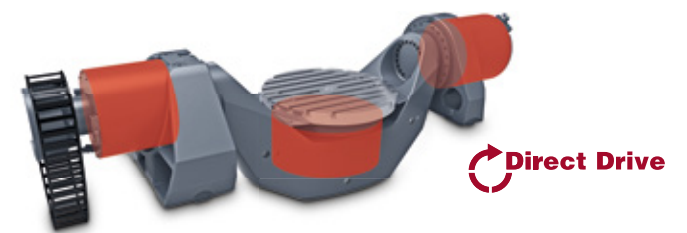
- + Dynamic C-axis with up to 80 rpm rapid traverse
- + Water-cooled Direct Drive on the C-axis



Direct Drive

3 Direct Drive technology on the A and C-axes

- + Maximum dynamics thanks to Direct Drive on the A-axis (tandem drive) and C-axis
- + Best positional uncertainty on the A and C-axis (7ws)



Direct Drive

PACKAGE MACHINE DMU 75 monoBLOCK®

4 CELOS® with MAPPS on FANUC

Now available for the DMU 75 monoBLOCK®



CELOS®

HIGHLIGHTS

- + Equipped with simple and easy-to-follow dialogue programming function
- + Rapid access to required information and manual data thanks to search function
- + 6-window display for checking all necessary machine information at once
- + Two multi-touch panels

Also available with:

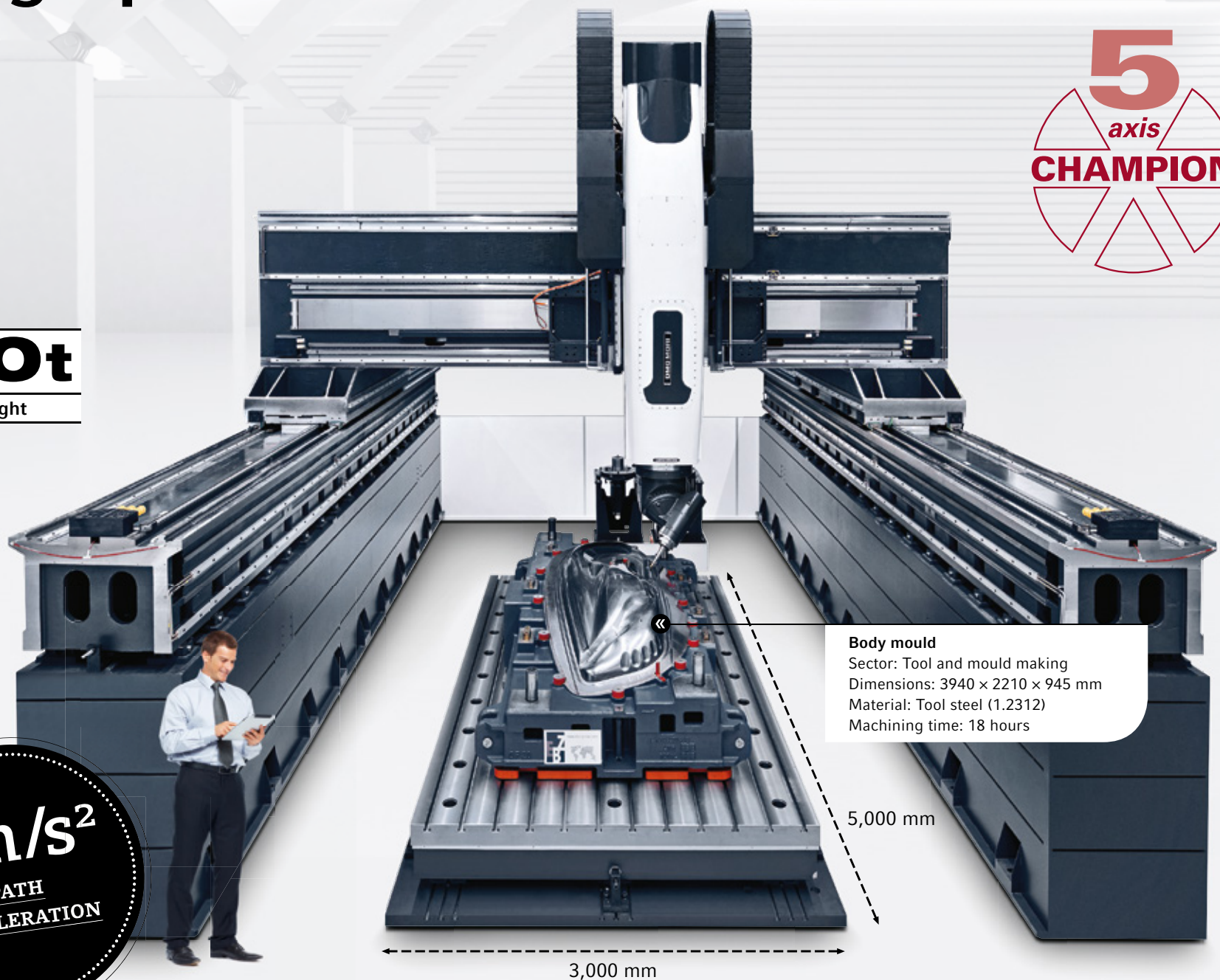
- + CELOS® with SIEMENS
- + HEIDENHAIN iTNC 640

The XXL range for all sizes and applications!

Ultra-modern machining of large parts!



up to
max. **150t**
workpiece weight



Body mould

Sector: Tool and mould making
Dimensions: 3940 × 2210 × 945 mm
Material: Tool steel (1.2312)
Machining time: 18 hours

NEW

The high-gantry machine DMU 600 Gantry *linear*

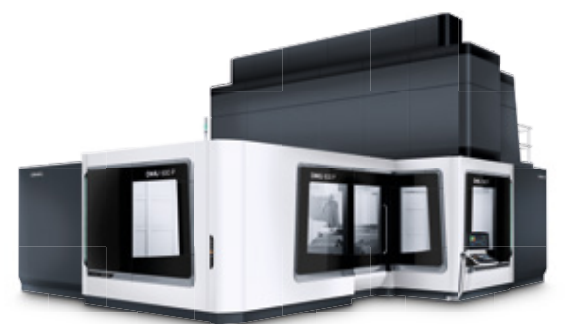
- + Highly dynamic 5-axis machining of workpieces up to 150 t with maximum demands on contour accuracy
- + Direct Drive technology on all axes for best quality surface finish and maximum dynamics, 3 m/s² path acceleration and 45 m/min feed
- + X-axis with 6,000 mm as standard can be extended at will
- + Z-axis ram with different travel distances up to max. 2,000 mm



DMU 600 P Portal machine

- + Maximum rigidity for machining components up to 40 t
- + Gantry design for maximum rigidity and precision
- + Low forces thanks to short lever arms
- + Up to 30 m/min rapid traverse/feed speeds on X / Y / Z-axis
- + High machining performance thanks to max. 2,500 Nm

up to
max. **40t**
workpiece weight



PREMIUM PARTNER

HAIMER GMBH – NOW ALSO WITH TOOL PRESETTERS

Premium partnership of DMG MORI and HAIMER – takeover of Microset GmbH

Joint sales of tool presetters



From left to right: Dr. Maurice Eschweiler, Board Member DMG MORI AKTIENGESELLSCHAFT, Claudia Haimer, Managing Partner Haimer GmbH, Christian Thönes, Chairman DMG MORI AKTIENGESELLSCHAFT, Andreas Haimer, Managing Director Haimer GmbH

The long-established partnership between DMG MORI and HAIMER is becoming closer. With effect from 1st January, 2017, HAIMER has taken over tool presetting technology from DMG MORI and with it the company Microset GmbH, which will now be known as HAIMER Microset GmbH. For HAIMER, this is the perfect addition to its market-leading assortment in the fields of tool clamping technology and Tool Management. All Microset products and services can still be obtained from DMG MORI as a provider of integrated solutions. All DMG MORI Technology and Solution Centres as well as suppliers' works throughout the world will be equipped exclusively by HAIMER with products in the fields of tool presetting, balancing and shrinking, including shrink chucks and tool rooms.



HAIMER PORTFOLIO IN THE DMG MORI TECHNOLOGY- AND SOLUTION CENTRES



HAIMER Microset tool presetting technology will complement the existing portfolio with high-precision tool (clamping), shrinking and balancing equipment. This will make HAIMER a Tool Management system provider for all aspects of machine tools.

ADVANTAGES

- + Your DMG MORI contacts will still be responsible for the sales and servicing of Microset products
- + We will continue to present HAIMER Microset units in all Technology Centres and at exhibitions
- + HAIMER as a comprehensive system provider for the Tool Management sector
- + Joint developments for digital production

HAIMER is opening a new Technology and Solution Centre at the Bielefeld factory. Experience the complete Tool-Management in all aspects of machine tools live on site.



HAIMER GmbH
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The Mark of Linear Motion

ADDITIVE MANUFACTURING

With the world premiere of the LASERTEC 30 SLM, DMG MORI is now extending its portfolio with the addition of powder bed processes!



New at DMG MORI: Selective laser melting

In collaboration with REALIZER GmbH, a pioneer in the field of SLM technology (Selective Laser Melting), DMG MORI is consolidating its position as GLOBAL ONE in the field of ADDITIVE MANUFACTURING!

HIGHLIGHTS

- + Generative manufacturing in the powder bed with a volume of 300 × 300 × 300 mm
- + Application-specific fibre laser sources of 400 W up to 1 kW
- + High-precision build-up of 3D components with layer thicknesses of 20 to 100 µm
- + Integral powder conditioning system for even better efficiency and material utilisation
- + Optimum process chain for subsequent machining on DMG MORI machines in the HSC and DMU range – for highest component accuracy and best surface finishes



Impeller
Dimensions: ø 44 × 27 mm
Material: Titanium
Machining time: 49 Min.

FIT FOR THE FUTURE
WITH SINUMERIK

DMG MORI

**PREMIUM
PARTNER**

SIEMENS

www.siemens.com/sinumerik



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FROM OPERATE 4.7

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optimised for multi-touch operation**

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- + Smart zooming and scrolling functions
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**Top Surface – Perfect Workpiece
Surfaces in Tool and Mould Making**

- + Smart motion control
- + Optimal surface quality
- + Highest milling precision
- + Simplest handling



REALIZER GMBH



Cooperation strengthens expertise in Additive Manufacturing

DMG MORI is specifically expanding its future technologies: With a majority shareholding of 50.1 % in Borchten-based REALIZER GmbH, the Group has now strengthened its position in the field of Additive Manufacturing.

With SAUER GmbH, DMG MORI already has extensive know-how in the Laser Metal Deposition field with powder nozzles. For its part, REALIZER has more than 20 years experience in "Selective Laser Melting" (SLM). Here, the powder material is deposited layer-by-layer and specifically melted using a laser, thus successively building up the component. The incorporation of REALIZER into the SAUER product range therefore now enables DMG MORI to offer the main generative manufacturing processes for metal workpieces from a single source.

"Selective laser melting in a powder bed opens up completely new applications for our customers. It is therefore an ideal complement to our LASERTEC 3D machines in the field of Advanced Technologies," says Christian Thönes, Chairman of DMG MORI Aktiengesellschaft.




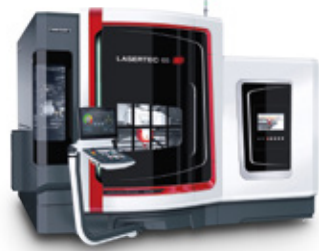
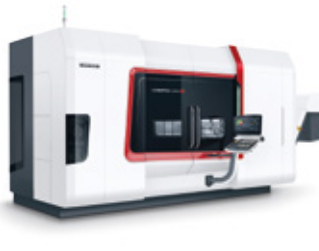
Christian Thönes (right), Chairman of DMG MORI AKTIENGESELLSCHAFT, and Dr. Matthias Fockele, Managing Partner of REALIZER GmbH, look forward to the future collaboration.

Complex, metal components can be manufactured from powder using Additive Manufacturing. A wide range of weldable materials, extending to multi-material applications, are used for this purpose depending on the application.

REALIZER

REALIZER GmbH
Hauptstraße 35, D-33178 Borchten
www.realizer.com

Globally unique – Additive Manufacturing with powder nozzle and in the powder bed from a single source

POWDER BED	POWDER NOZZLE	
		
LASERTEC 30 <i>SLM</i>	LASERTEC 65 <i>3D</i>	LASERTEC 4300 <i>3D</i>
LASER STRUCTURING	LASER STRUCTURING + MILLING / TURNING	



Watch the video on Additive Manufacturing
dmgmori.com/en6461



SIEMENS
Ingenuity for life

NX Hybrid Additive Manufacturing

The integrated software solutions for Additive Manufacturing, incl. simulation and programming of Laser Metal Deposition and Laser Metal Fusion.

siemens.com/plm/additivemanufacturing

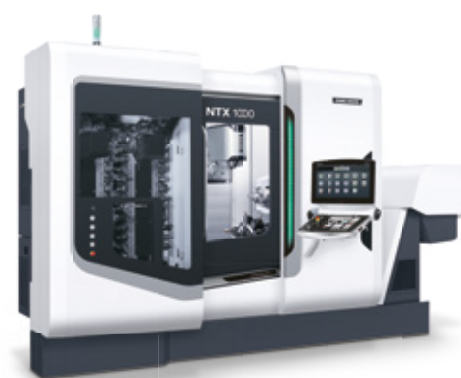
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- + **Integrated manufacturing solutions** and technology support for medical applications
- + **Customised developments and consultation** as well as training courses and seminars
- + **Pioneering and innovative developments** of processes and machines, e.g. ULTRASONIC
- + **Highly accurate endoprostheses**, e.g. knee and hip joints made from titanium, CoCr and ceramic



NTX 1000
(DDM® technology) on the B-axis for the 5-axis simultaneous machining of complex workpieces

1

Hip joint socket
Dimensions: ø 60 mm
Material: Titanium





2

Tooth implant
 Dimensions: $\varnothing 10 \times 7$ mm
 Material: Titanium (Ti6Al4V)



MILLTAP 700
 Highly productive compact machining centre for the economic mass production of implants and bone plates



4

Knee prosthesis
 Dimensions: $62 \times 70 \times 68$ mm
 Material: CoCr



DMU 40 eVo *linear*
 Dynamic 5-axis simultaneous machining of implants and joints made from difficult-to-machine materials



3

Bone screw
 Dimensions: $\varnothing 10 \times 85$ mm
 Material: Titanium (Ti6Al4V)



SPRINT 2015 SWISSTYPEkit®
 for the short and long turning of high-precision implants on one machine



5

Bone plate
 Dimensions: $60 \times 18 \times 3$ mm
 Material: Titanium



ULTRASONIC 20 *linear*
 5-axis ULTRASONIC and HSC machining for prototypes and automated mass production up to 200 mm component size

Highest accuracy – unique

**3X
MORE PRECISE**

- +** 500 hours scraping on the guideways
- +** +80% volumetric accuracy to < 15 μm
- +** Positioning accuracy of up to 3 μm*
- +** Individual optimisation at the user's premises

*Applies to 125 duoBLOCK® frame size

AVAILABLE FOR
 DMU/C 125 P/U/FD duoBLOCK®
 +
 DMU/C 210/270 P/U/FD PORTAL
 +
 NHX 8000



AEROSPACE

Gearbox housing for turbine units
 Material: Aluminium
 Holes better than H5
 Positional tolerances: 12–15 μm

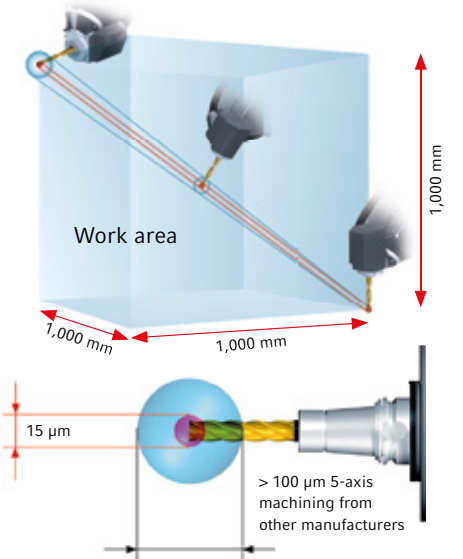


MECHANICAL ENGINEERING

Table console
 Material: Cast iron
 High-precision finishing and 5-sided milling
 Shape and positional tolerances in the region of 10 μm

3-TIMES HIGHER ACCURACY!

15 μm volumetric accuracy



At least 3-times higher accuracy over the whole machining range.

Technical Data		DMU/C 125 μPrecision	DMU/C 210 μPrecision	DMU/C 270 μPrecision	NHX 8000 μPrecision
Max. travel (X)	mm	1,250	2,100	2,700	1,400
Positioning accuracy X/Y/Z	μm	4/3/4	4/4/4	6/6/6	4/4/4
Positioning accuracy A/B/C	ws	5/4/4	5/4/4	5/4/4	-/4/-

*after space compensation; only linear axes taken into account

Experience DMG MORI live!

NEXT EVENTS:

- + VTM, Odense / DNK 28/02 – 03/03/2017
- + INTEC, Leipzig / D 07/03 – 10/03/2017
- + MECSPE, Parma / IT 23/03 – 25/03/2017
- + Open House Ulyanovsk / RU 04/04 – 07/04/2017
- + Industrie, Lyon / F 04/04 – 07/04/2017
- + Open House Pleszew / PL 11/04 – 14/04/2017
- + Open House Bielefeld / D 09/05 – 12/05/2017
- + MACH-TECH, Budapest / HU 09/05 – 12/05/2017
- + Metalloobrabotka, Moscow / RU 15/05 – 19/05/2017
- + Open House Bergamo / IT 16/05 – 20/05/2017
- + Moulding Expo, Stuttgart / D 30/05 – 02/06/2017



Experience DMG MORI live:
events.dmgmori.com

Open House
 Bielefeld
 09/05 – 12/05/2017



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